

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of the claims in the application.

Listing of Claims:

Claim 1. (Currently amended) 1. A bypass valve comprising:
a housing having a hollow plug portion with opposed plug walls, at least one of the plug walls defining a transversely located inlet or and outlet opening therein; openings in said plug walls,
the bypass valve housing also having an actuator portion located adjacent to the plug portion, the actuator portion having seal means for preventing flow out of no inlet and outlet openings for flow through the actuator portion; and
an actuator releasably mounted in the actuator portion and having a reciprocating plunger extending axially into the plug portion to block and unblock transverse flow between through said bypass valve transversely located inlet or and outlet opening-openings.

Claim 2. (Original) A bypass valve as claimed in claim 1 wherein the actuator is a temperature responsive actuator having a central shaft mounted in the housing actuator portion and a reciprocating barrel portion forming said plunger.

Claim 3. (Previously presented) A bypass valve as claimed in claim 2 wherein the actuator is a thermal motor adapted to extend axially upon being heated to a predetermined temperature and to retract upon being cooled below said predetermined temperature.

Claim 4. (Previously presented) A bypass valve as claimed in claim 2 wherein the housing actuator portion includes a removable closure located remote from the plug portion, the actuator central shaft being attached to the removable closure.

Claim 5. (Previously presented) A bypass valve as claimed in claim 3 or 4 and further comprising biasing means located in the housing for urging the actuator to retract and the plunger to unblock the flow through the bypass valve.

Claim 6. (Currently amended) A bypass valve as claimed in claim 1 wherein the housing plug portion opposed plug walls are flat, parallel side walls, said at least one of the plug walls defining said transversely located inlet or outlet opening~~-bypass valve inlet and outlet openings.~~

Claim 7. (Cancelled)

Claim 8. (Withdrawn) A bypass valve as claimed in claim 2 and further comprising a spring located in the housing actuator portion to urge the central shaft toward the housing plug portion.

Claim 9. (Withdrawn) A bypass valve as claimed in claim 4 and further comprising a spring located between the removable closure and the actuator central shaft to urge the actuator into the housing plug portion.

Claim 10. (Withdrawn) A bypass valve as claimed in claim 1 wherein the actuator includes a solenoid having a central actuator shaft attached to the plunger, the shaft extending upon energization of the solenoid, so that the plunger blocks flow between the inlet and outlet openings, and further comprising bias means for urging the actuator shaft to retract upon de-energization of the solenoid.

Claim 11. (Withdrawn) A bypass valve as claimed in claim 10 and further comprising a temperature sensor electrically coupled to the solenoid for activation of the solenoid when the temperature of the fluid going to the heat exchanger reaches a pre-determined temperature.

Claim 12. (Withdrawn) A bypass valve as claimed in claim 11 wherein the temperature sensor is a thermistor mounted on the plunger.

Claim 13. (Withdrawn) A bypass valve as claimed in claim 12 and further comprising an electrical control circuit mounted in the housing and electrically connected between the thermistor and the solenoid for controlling the movement of the plunger in accordance with the temperature sensed by the thermistor.

Claim 14. (Currently amended) A heat exchanger comprising:

a plurality of tubular members having spaced-apart wall portions defining flow openings in the wall portions for the flow of fluid through the tubular members;

a bypass valve including a housing having a hollow plug portion with opposed plug walls defining inlet and outlet openings in said plug walls;

said plug walls being sealingly mounted between selected ones of said spaced-apart wall portions to allow fluid flow between said plug wall ~~bypass valve~~ inlet and outlet openings and respective flow openings in said selected ones of said spaced-apart wall portions;

at least one of the inlet and outlet openings in the plug walls being transversely located in its respective plug wall;

the bypass valve housing also having an actuator portion located adjacent to the plug portion, the actuator portion having ~~no inlet and outlet openings for flow through~~ seal means for preventing flow out of the actuator portion; and

an actuator releasably mounted in the actuator portion and having a reciprocating plunger extending axially into the plug portion to block and unblock transverse flow ~~between~~ through said at least one of the bypass valve transversely located inlet and outlet openings.

Claim 15. (Previously presented) A heat exchanger as claimed in claim 14 wherein the tubular members are formed of plate pairs having enlarged distal end portions joined together to form adjacent inlet and outlet manifolds, said selected ones of said spaced-apart wall portions being formed in the distal end portions of an adjacent plate pair from each manifold, so that fluid can flow between the inlet and outlet manifolds when the flow through the bypass valve is unblocked.

Claim 16. (Cancelled)

Claim 17. (Original) A heat exchanger as claimed in claim 14 wherein the actuator is a temperature responsive actuator having a central shaft mounted in the housing actuator portion and a reciprocating barrel portion forming said plunger.

Claim 18. (Previously presented) A heat exchanger as claimed in claim 17 wherein the actuator is a thermal motor adapted to extend axially upon being heated to a predetermined temperature and to retract upon being cooled below said predetermined temperature.

Claim 19. (Withdrawn) A heat exchanger as claimed in claim 14 wherein the actuator includes a solenoid having a central actuator shaft attached to the plunger the shaft extending upon energization of the solenoid, so that the plunger blocks flow between the inlet and outlet openings, and further comprising bias means for urging the actuator shaft to retract upon de-energization of the solenoid.

Claim 20. (Withdrawn) A heat exchanger as claimed in claim 19 and further comprising a temperature sensor electrically coupled to the solenoid for activation of the solenoid when the temperature of the fluid going to the heat exchanger reaches a pre-determined temperature.